

REMARKS

Claims 1-20 remain pending in the above-identified application and stand ready for further action on the merits.

Claim Rejections under 35 USC §103(a)

Claims 1-20 have been rejected under the provisions of 35 USC § 103(a) as being obvious over **Kizu et al. US '739** (US 2003/0165739) in view of **Takami et al. US '387** (US 5,753,387) and further in view of **Ohsaki et al. US '043** (US 5,856,043), OR over **Ohsaki et al. US '043** in view of **Kizu et al. US '739** and further in view of **Takami et al. US '387**.

Reconsideration and withdraw of the above rejection is respectfully requested based on the following considerations.

Legal Standard for Determining Prima Facie Obviousness

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

“There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art.” *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) (The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a *prima facie* case of obvious was held improper.).

“In determining the propriety of the Patent Office case for obviousness in the first instance, it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the reference before him to make the proposed substitution, combination, or other modification.” *In re Linter*, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. “The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art.” *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also *In re Lee*, 277 F.3d 1338, 1342-44, 61 USPQ2d 1430, 1433-34 (Fed. Cir. 2002) (discussing the importance of relying on objective evidence and making specific factual findings with respect to the motivation to combine references); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The Supreme Court of the United States has recently held that the teaching, suggestion, motivation test is a valid test for obviousness, but one which cannot be too rigidly applied. See *KSR Int'l Co. v. Teleflex Inc.*, 127 SCt 1727, 82 USPQ2d 1385 (U.S. 2007). The Supreme Court in *KSR Int'l Co. v. Teleflex, Inc.*, *ibid.*, reaffirmed the Graham factors in the determination of obviousness under 35 U.S.C. § 103(a). The four factual inquiries under Graham are:

- (a) determining the scope and contents of the prior art;
- (b) ascertaining the differences between the prior art and the claims in issue;
- (c) resolving the level of ordinary skill in the pertinent art; and
- (d) evaluating evidence of secondary consideration.

Graham v. John Deere, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (U.S. 1966).

The Court in *KSR Int'l Co. v. Teleflex, Inc.*, *supra.*, did not totally reject the use of "teaching, suggestion, or motivation" as a factor in the obviousness analysis. Rather, the Court recognized that a showing of "teaching, suggestion, or motivation" to combine the prior art to meet the claimed subject matter could provide a helpful insight in determining whether the claimed subject matter is obvious under 35 U.S.C. § 103(a).

Even so, the Court in *KSR Int'l Co. v. Teleflex, Inc.*, *ibid.*, rejected a rigid application of the "teaching, suggestion, or motivation" (TSM) test, which required a showing of some teaching, suggestion, or motivation in the prior art that would lead one of ordinary skill in the art to combine the prior art elements in the manner claimed in the application or patent before holding the claimed subject matter to be obvious.

Further, the Examiner bears the initial burden of presenting a *prima facie* case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336, quoted with approval in *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007).

The Present Invention

As described in claim 1, the negative electrode of the present invention is characterized in that carbon black used as an electrically conducting aid comprises particles having an aspect ratio of 1.0 to 5.0 and a largest particle size of 10 μm or less, and the negative electrode has a density of at least 1.50 g/cm^3 .

Distinctions Over the Cited Art

Kizu et al. US ‘739

Kizu et al. US ‘739 discloses a negative electrode for a non-aqueous secondary cell comprising graphite as a negative electrode active material, a conductive material which comprises carbon black, and a binder, and describes that graphite preferably has a spacing of lattice planes of 0.3355 to 0.3380 nm and a specific surface area of 1.5 to 30 μm . Further, Kizu et al. US ‘739 describes that when carbon black is used as a conductive material, graphite preferably has an average particle size of not more than 5 μm .

However, the USPTO may misunderstand some parts of the disclosure of Kizu et al. US ‘739 as explained below.

First, the USPTO alleges that “the amount of conductive material is preferably 22-8%.” However, such an amount of a conductive material is not described by Kizu et al. US ‘739. Paragraph [0063] of Kizu et al. US ‘739 describes that the amount of a conductive material is 0.5 to 10 parts by weight per 100 parts by weight of a positive electrode active material. This amount of the conductive material is that in a positive electrode, not in a negative electrode.

Second, the applicants cannot understand what is meant by “[A]s the size of the carbon black conductive material is not to be more than 5 μm , the ratio of the particles of carbon black is greater than 10%.” (See *page 3, lines 9-10 of the Office Action.*) It is submitted, however, that the size of the carbon black conductive material has no relationship with the ratio of the particles of carbon black.

Third, the USPTO alleges that “the preferred particle size is 5-10 microns (p. 137 and 141).” However, paragraph [0137] relates to the average fiber length and the aspect ratio of graphite fibers, which is preferable in view of the coatability thereof when the graphite fibers are used as a negative electrode active material. Thus, the average fiber length and the aspect ratio described in paragraph [0137] are not those of the carbon black conductive material. Paragraph [0141] describes that carbon black, which is optionally used as a conductive material for a negative electrode, may have an average particle size of not more than 5 μm . However, “an aspect ratio of 1.0 to 5.0” is not described.

Fourth, the USPTO says that “binders are noted” (paragraph 0128). Paragraph [0128] describes that “[A]s a binder of the negative electrode active material, the same binder as those for the above-mentioned positive electrode active material can be used” and no specific binder is

exemplified in this paragraph. The binders for the positive electrode active material are described in paragraph [0073] and the examples thereof are polytetrafluoroethylene, poly(vinylidene fluoride), polyethylene, ethylene-propylene-diene polymer and the like. But, no aqueous binder is described as the USPTO acknowledges.

Ohsaki et al. US '043

Ohsaki et al. US '043 discloses a non-aqueous electrolyte secondary battery (cell) comprising graphitized vapor-grown carbon fibers having a specific surface area of at most $5 \text{ m}^2/\text{g}$ and an average aspect ratio of 2-30, and describes that the packing density of the negative electrode is preferably $1.5\text{-}1.8 \text{ g/cm}^3$ (*see column 7, lines 7-8*).

However, Ohsaki et al. US '043 describes in the paragraph bridging columns 4 and 5 that “(W)hen the average aspect ratio is within the range, electric conductivity of the electrode itself becomes increased. Thus, addition of the materials for improving conductivity can be obviated and a non-aqueous electrolyte secondary battery with improved safety can be provided” (*emphasis added*).

The USPTO alleges that “Ohsaki et al. US '043 ... teaches a negative electrode for a non-aqueous secondary cell comprising graphite, carbon black and a binder (col. 3, line 40 to col. 6, line 30; col. 4, lines 23-30; col. 5, lines 1-20; col. 6, lines 25-30), wherein said carbon black comprises particles having an aspect ratio in the range of 1.0 to 5.0 and a largest particle size of 1-10 and preferably 2-5 μm ”. However, Ohsaki et al. US '043 describes in column 4, lines 23-29 that “when a graphitized vapor-grown carbon fiber is used in a specific packing density, conductivity of the anode increases. Thus, addition of materials for improving conductivity, such as acetylene black, which is a high conductive carbon black having a remarkably great specific

surface area, is not necessary, which leads to a marked increase of safety of the battery” (*emphasis added*).

The above descriptions of Ohsaki et al. US ‘043 strongly suggest the adverse influence of the addition of the materials for improving conductivity. This is evidenced by Example 5 in which a mixture of graphitized mesocarbon microbeads (MCMB) and acetylene black is used. With the battery of Example 5, rupture of positive electrode cap was “Yes” and Smoking was also “Yes” (*see TABLE 2 in column 13*).

Accordingly, there would have been no reason or rationale to combine Ohsaki et al. US ‘043, which teaches away the addition of conductive materials to a negative electrode, with the other cited references of record.

Takami et al. US ‘387

The lithium secondary battery of Takami et al. US ‘387 is characterized in that a carbonaceous material having a region of amorphous carbon structure and a region of graphite structure is used as a negative electrode active material. Takami et al. US ‘387 describes the use of an aqueous binder such as styrene-butadiene rubbers, carboxymethylcellulose, and the like. However, Takami et al. US ‘387 is silent on the addition of a conductive material to the negative electrode.

Combination of Cited Art References

Accordingly, the present invention would not have been obvious from any combination of Kizu et al US ‘739, Ohsaki et al. US ‘043 and Takami et al. US ‘387. In support of this contention, it is noted that a person having ordinary skill in the art, upon considering the combined disclosures of the cited art references would find no reason or rationale that would allow them to arrive at the instant invention as claimed.

Accordingly, the outstanding 35 USC § 103(a) rejection is not sustainable. Any contentions of the USPTO to the contrary must be reconsidered at present,

CONCLUSION

Based upon the amendments and remarks presented herein, the Examiner is respectfully requested to issue a Notice of Allowance clearly indicating that each of pending claims 1-20 are allowed and patentable under the provisions of Title 35 of the United States Code.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact John W. Bailey (Reg. No. 32,881) at the telephone number below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

By 

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